FIG. 1

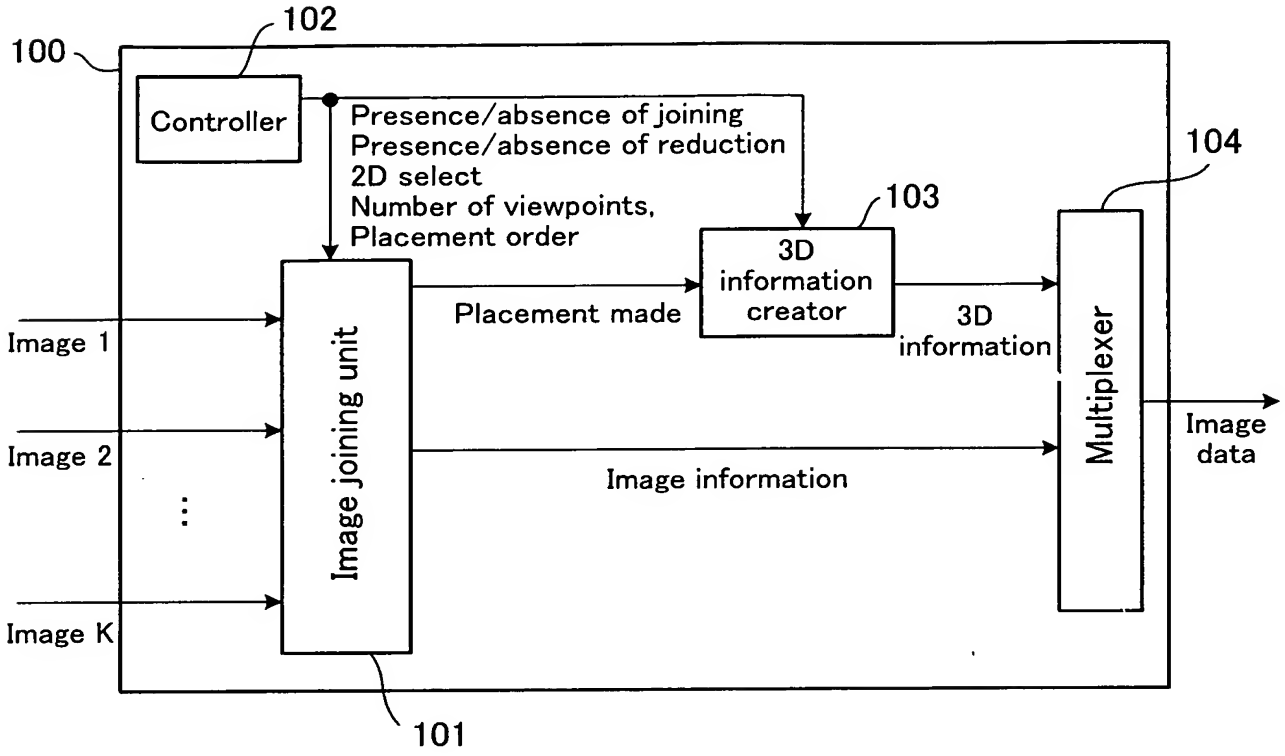

100
102
Controller
Presence/absence of joining
Presence/absence of reduction
2D select
Number of viewpoints,
Placement order
103
3D information creator
104
Multiplexer
Image 1
Image 2
Image K
Image joining unit
Placement made
3D information
Image information
Image data
101

FIG. 2

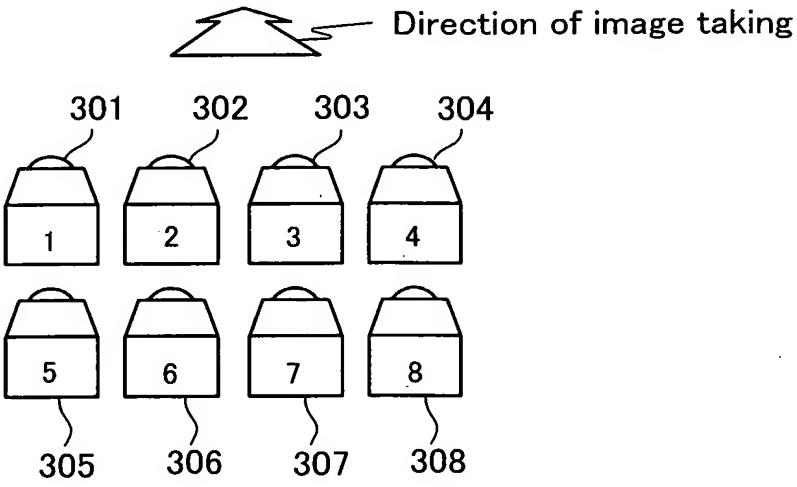

Direction of image taking
301
302
303
304
1
2
3
4
5
6
7
8
305
306
307
308

FIG. 3

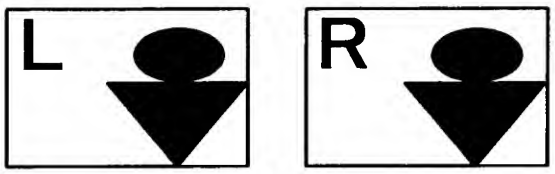
1	2	3	4
5	6	7	8

(a)

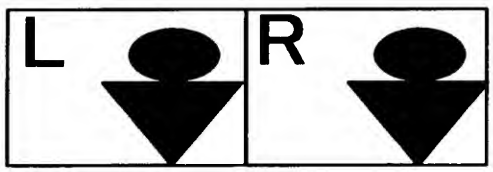
2	3	1	4
6	7	5	8

(b)

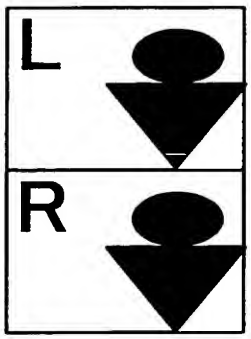
FIG. 4



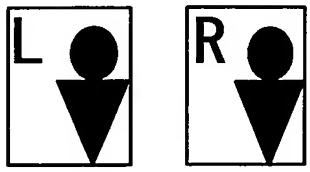
(a)



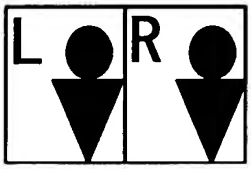
(b)



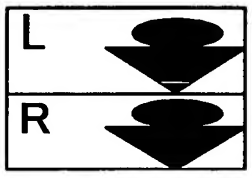
(c)



(d)

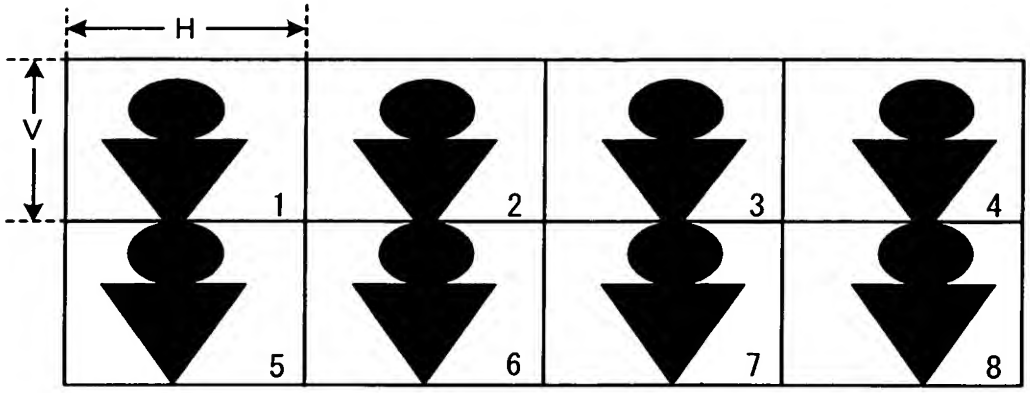


(e)

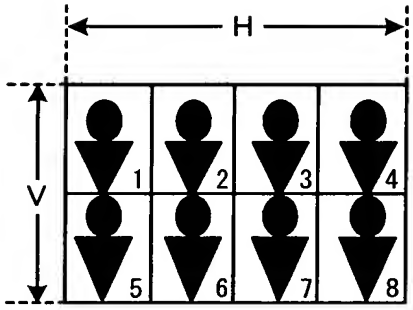


(f)

FIG. 5



(a)



(b)

FIG. 6

Presence/absence of joining
Presence/absence of reducti on
Number of viewpoints in the horizontal direction
Number of viewpoints in the vertical direction
2D select
Presence/absence of joining
Order of images
1st viewpoint
⋮
Kth viewpoint

FIG. 7

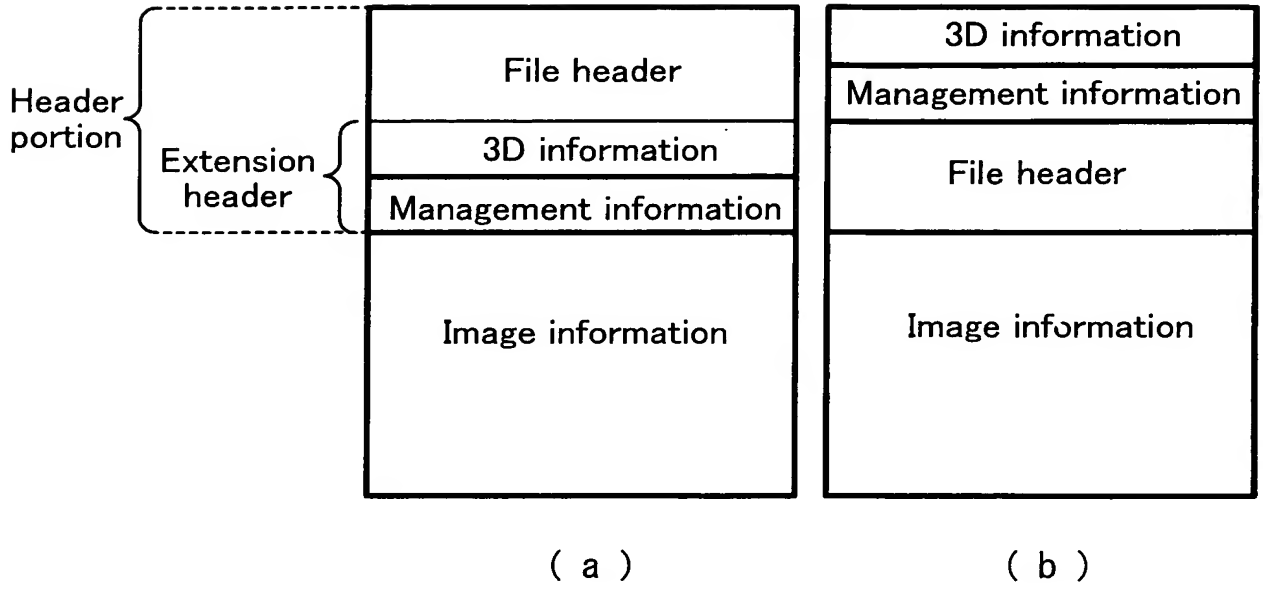

Header portion
Extension header
File header
3D information
Management information
Image information
3D information
Management information
File header
Image information
(a)
(b)

FIG. 8

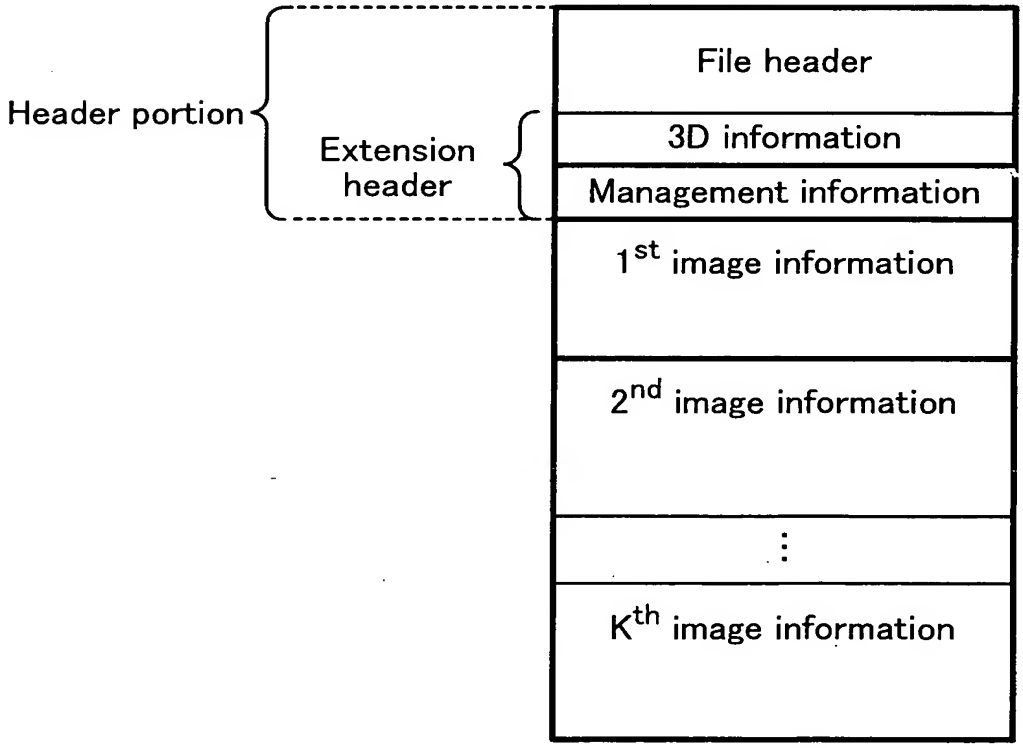

Header portion
Extension header
File header
3D information
Management information
1st image information
2nd image information
⋮
Kth image information

FIG. 9

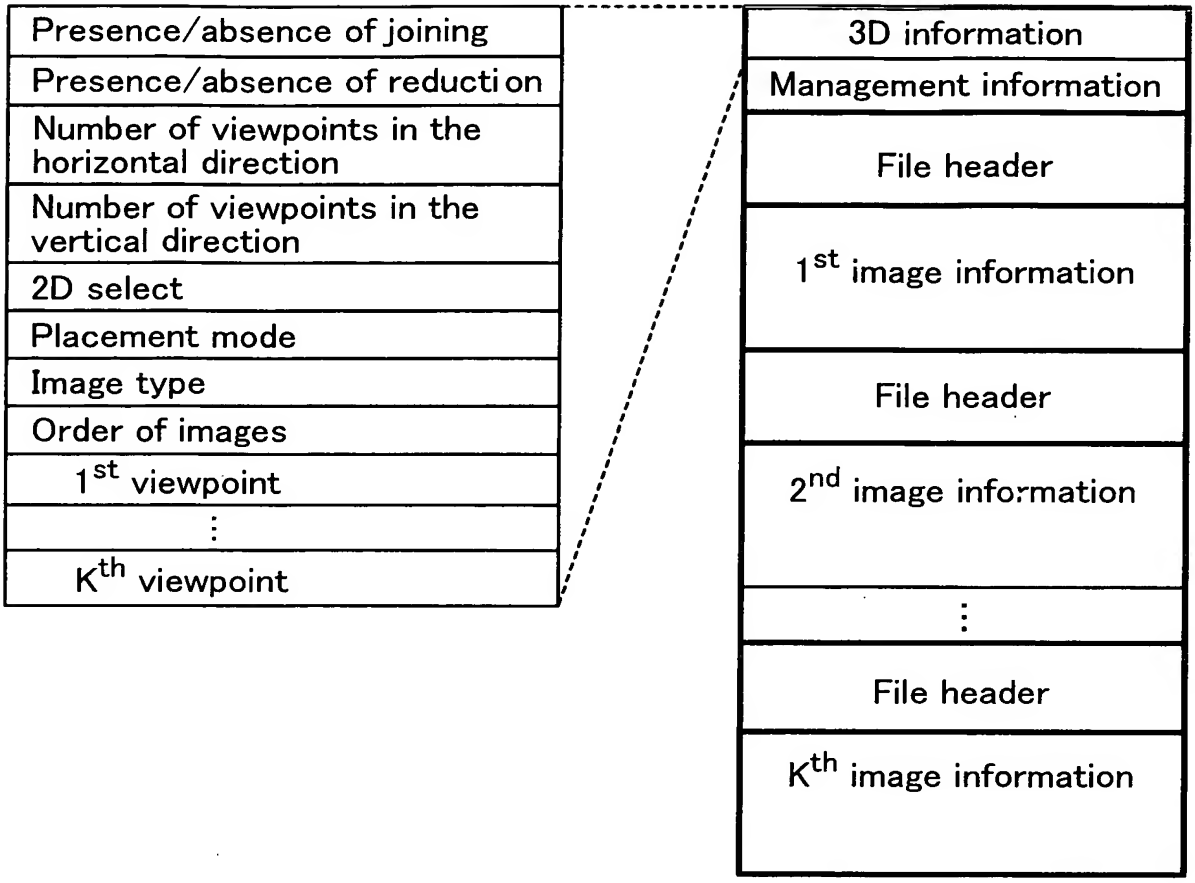

Presence/absence of joining
Presence/absence of reduction
Number of viewpoints in the horizontal direction
Number of viewpoints in the vertical direction
2D select
Placement mode
Image type
Order of images
1st viewpoint
Kth viewpoint
3D information
Management information
File header
1st image information
File header
2nd image information
File header
Kth image information

FIG. 10

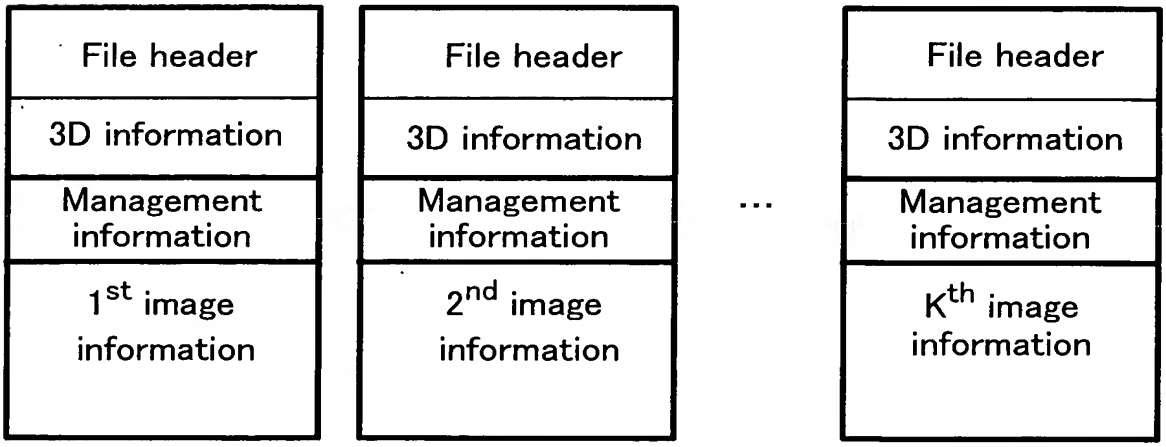

File header
3D information
Management information
1st image information
File header
3D information
Management information
2nd image information
File header
3D information
Management information
Kth image information

FIG. 11

Presence/absence of joining
Presence/absence of reduction
Number of viewpoints in the horizontal direction
Number of viewpoints in the vertical direction
2D select
Placement mode
Viewpoint number

FIG. 12

Presence/absence of joining = unjoined
Presence/absence of reduction = no reduction
Number of viewpoints in the horizontal direction = 2
Number of viewpoints in the vertical direction = 1
2D select = 1
Viewpoint number = 1

(a)

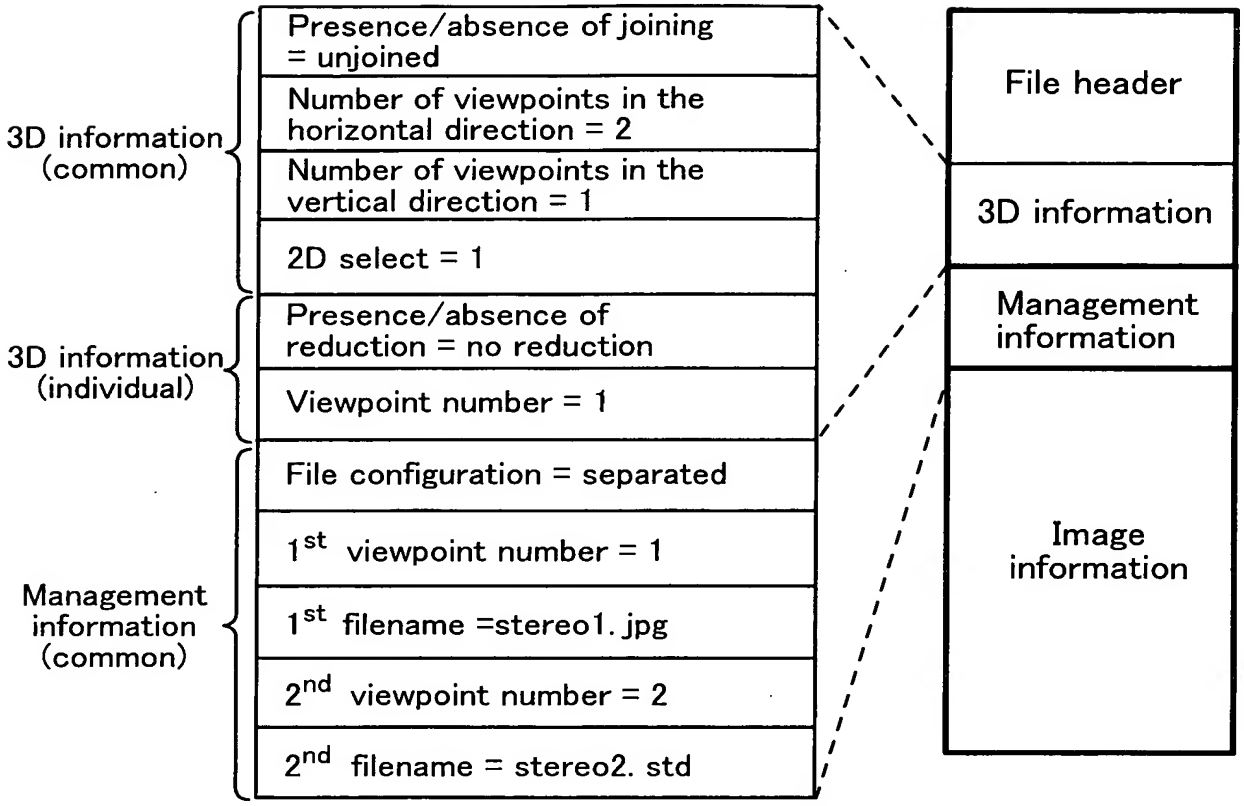
Presence/absence of joining = unjoined
Presence/absence of reduction = reduced
Number of viewpoints in the horizontal direction = 2
Number of viewpoints in the vertical direction = 1
2D select = 1
Viewpoint number = 2

(b)

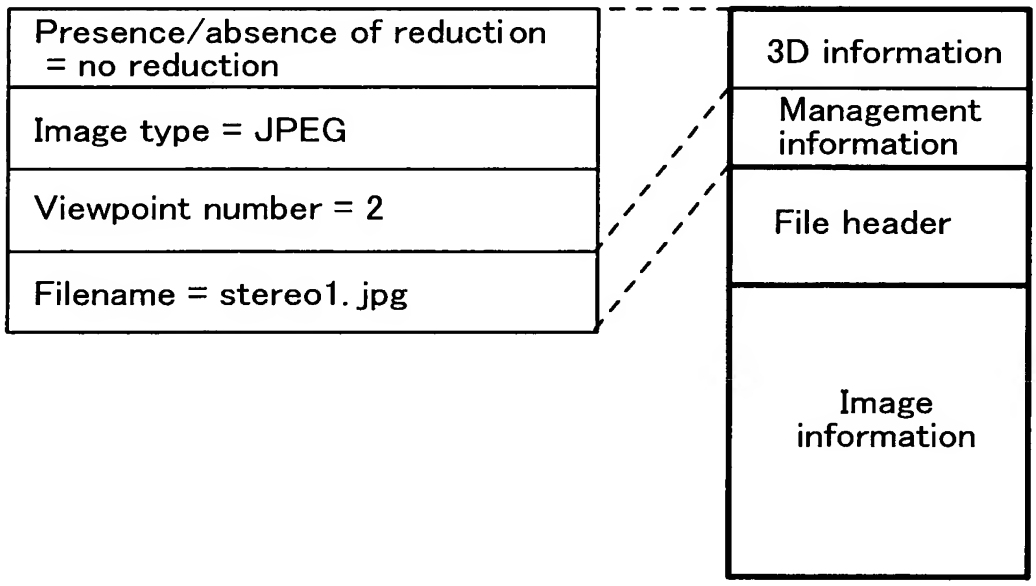
FIG. 13

File configuration
1^{st} viewpoint number
1^{st} filename
2^{nd} viewpoint number
2^{nd} filename
⋮
K^{th} viewpoint number
K^{th} filename

FIG. 14


3D information (common)
3D information (individual)
Management information (common)
Presence/absence of joining = unjoined
Number of viewpoints in the horizontal direction = 2
Number of viewpoints in the vertical direction = 1
2D select = 1
Presence/absence of reduction = no reduction
Viewpoint number = 1
File configuration = separated
1st viewpoint number = 1
1st filename =stereo1. jpg
2nd viewpoint number = 2
2nd filename = stereo2. std
File header
3D information
Management information
Image information

(a)


Presence/absence of reduction = no reduction
Image type = JPEG
Viewpoint number = 2
Filename = stereo1. jpg
3D information
Management information
File header
Image information

(b)

FIG. 15

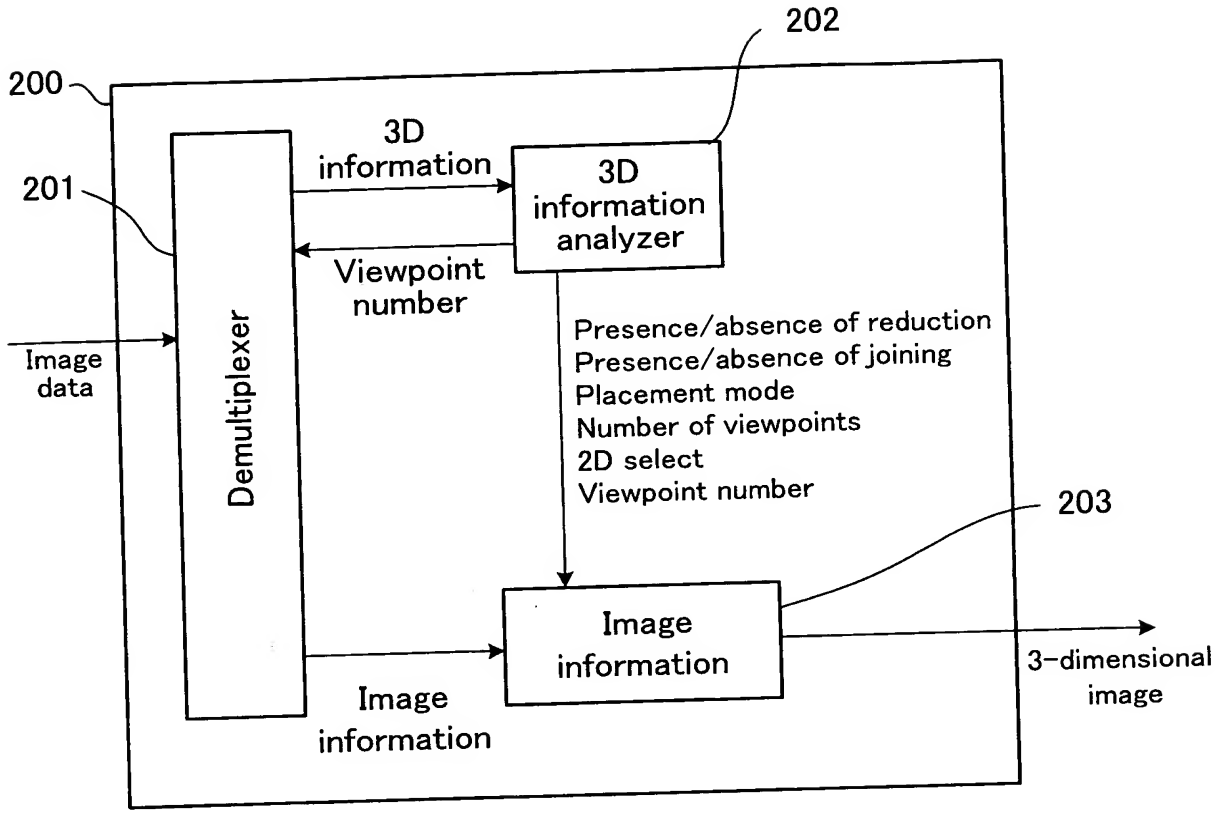

200
202
201
3D information
3D information analyzer
Viewpoint number
Image data
Demultiplexer
Presence/absence of reduction
Presence/absence of joining
Placement mode
Number of viewpoints
2D select
Viewpoint number
203
Image information
3-dimensional image
Image information

FIG. 16

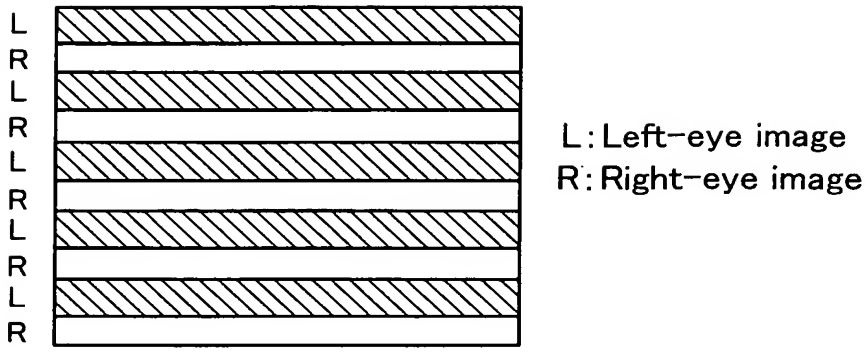
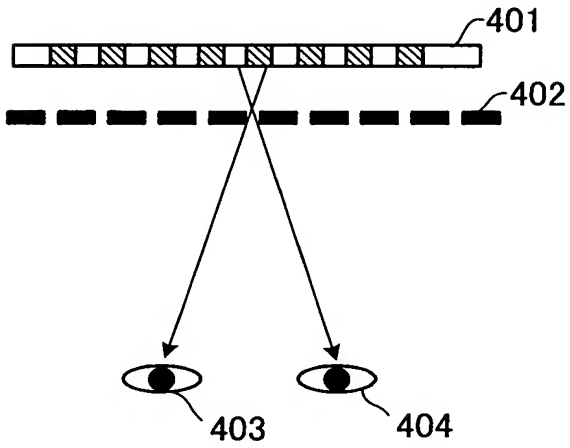
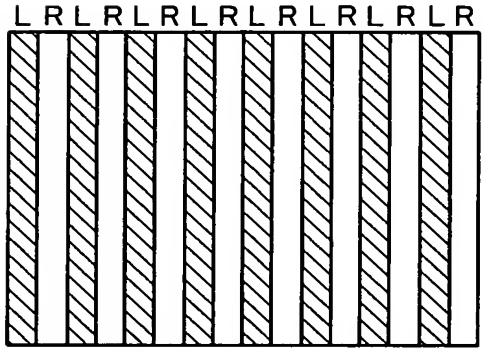


FIG. 17

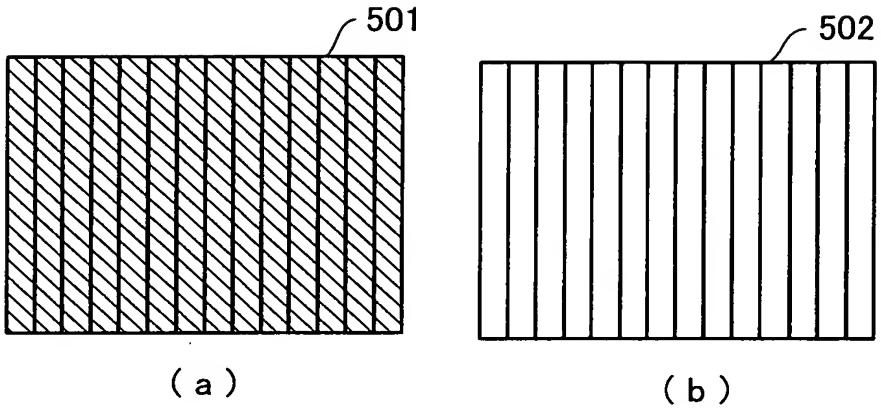


(a)



(b)

FIG. 18



(a)

(b)

(c)

FIG. 19

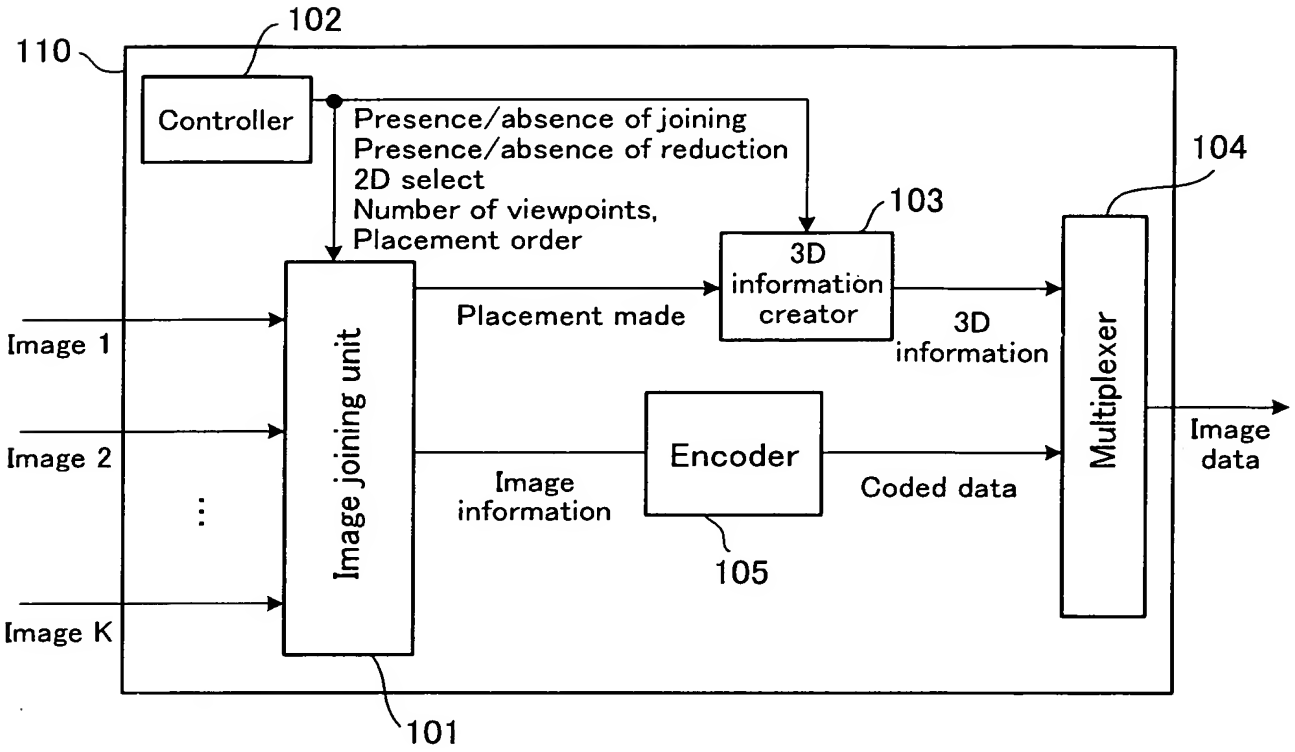

110
102
Controller
Presence/absence of joining
Presence/absence of reduction
2D select
Number of viewpoints,
Placement order
103
3D information creator
104
Multiplexer
Image 1
Image 2
Image K
Image joining unit
Placement made
3D information
Image information
Encoder
Coded data
Image data
105
101

FIG. 20

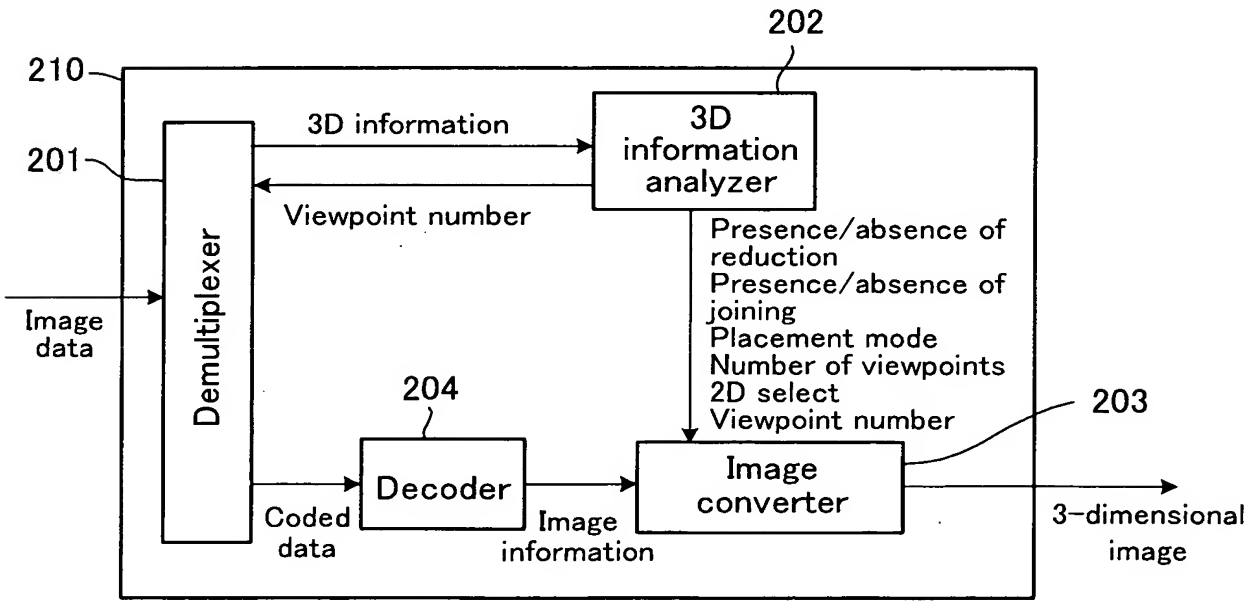
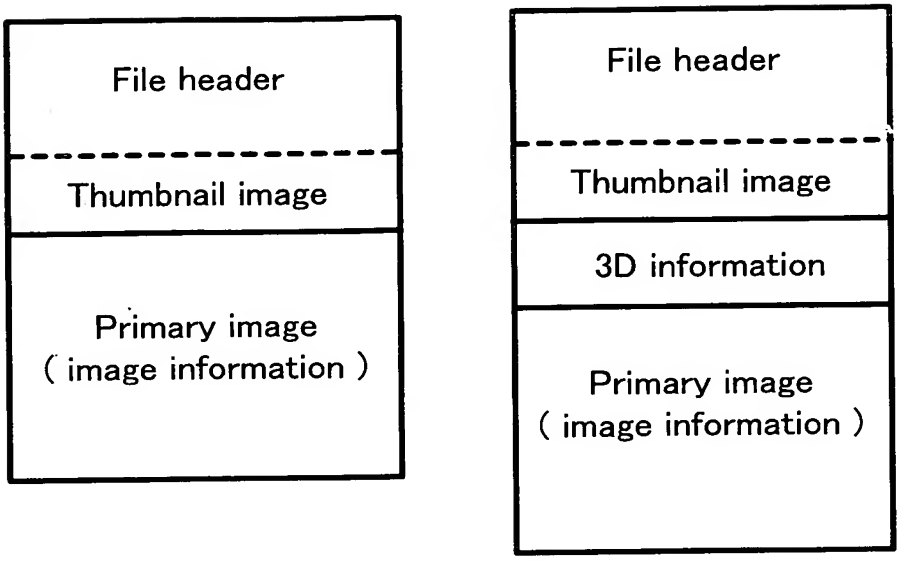
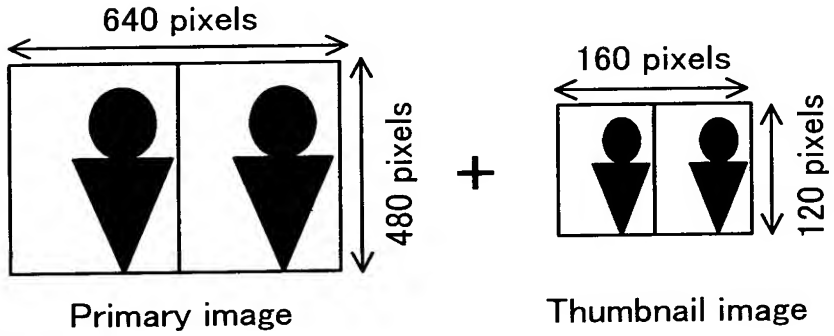

202
210
201
3D information
3D information analyzer
Viewpoint number
Demultiplexer
Presence/absence of reduction
Presence/absence of joining
Placement mode
Number of viewpoints
2D select
Viewpoint number
Image data
204
203
Decoder
Image converter
Coded data
Image information
3-dimensional image

FIG. 21

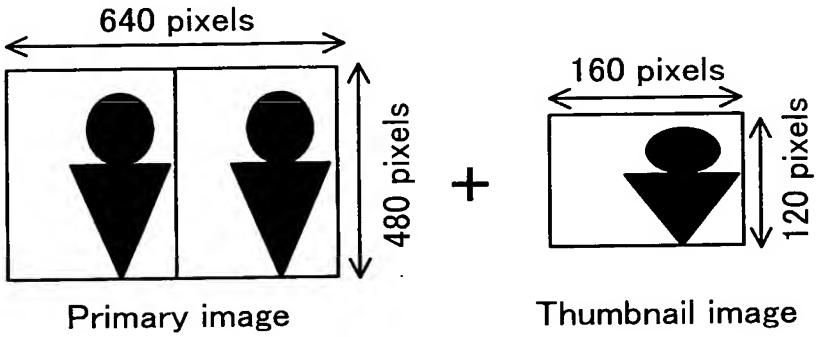


(a) (b)

FIG. 22

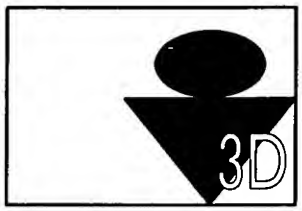


(a)

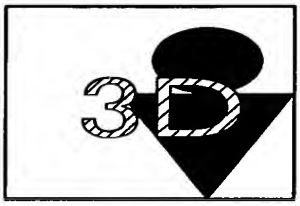


(b)

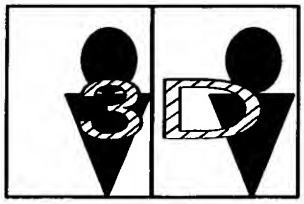
FIG. 23



(a)

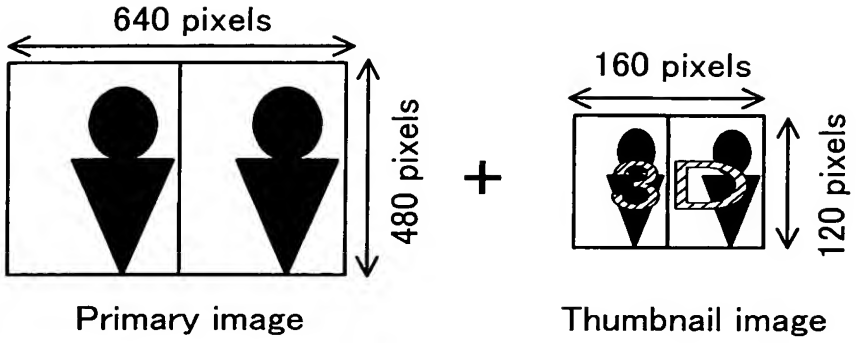


(b)

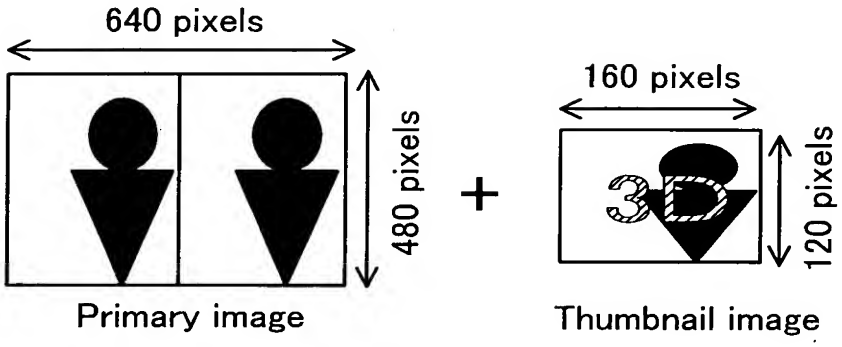


(c)

FIG. 24

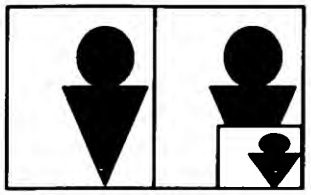

640 pixels
480 pixels
160 pixels
120 pixels
Primary image
Thumbnail image

(a)

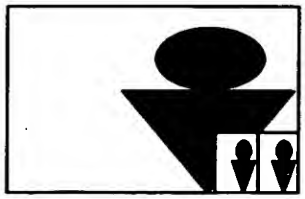

640 pixels
480 pixels
160 pixels
120 pixels
Primary image
Thumbnail image

(b)

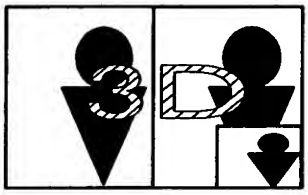
FIG. 25



(a)



(b)



(c)

(d)

FIG. 26

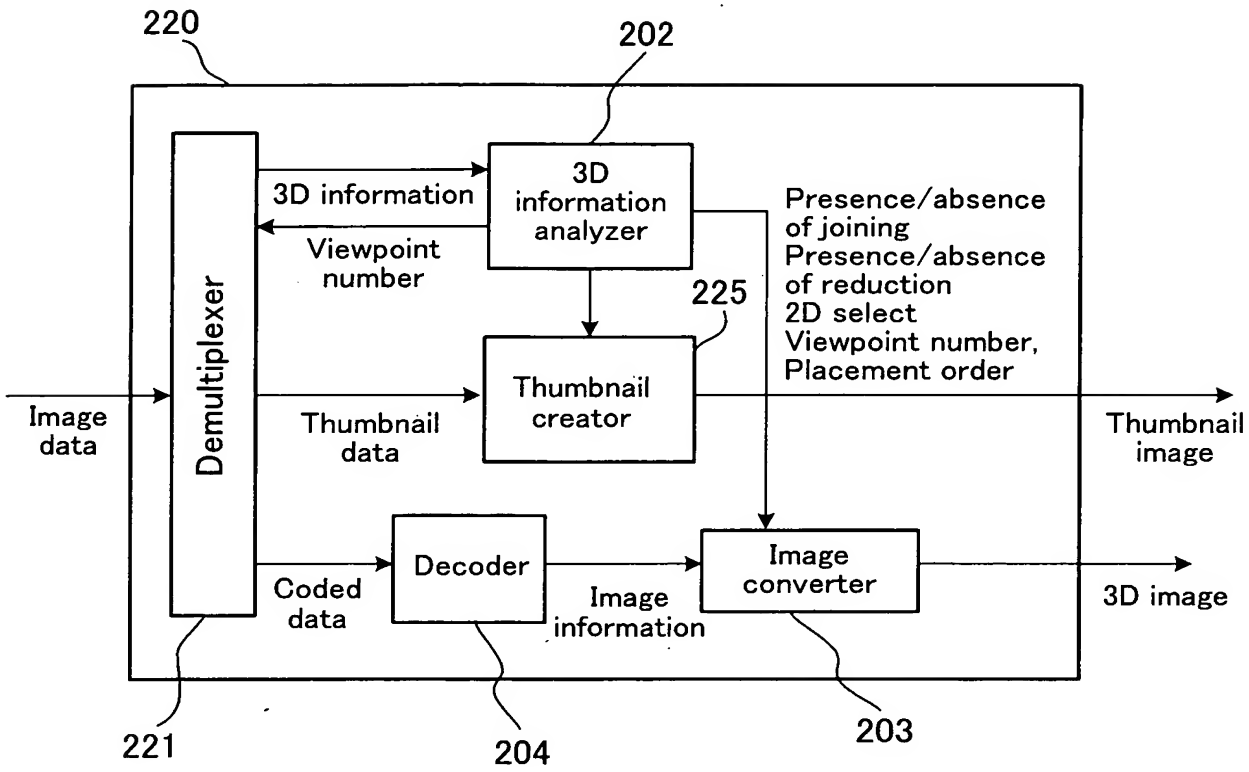

220
202
3D information analyzer
3D information
Viewpoint number
Presence/absence of joining
Presence/absence of reduction
2D select
Viewpoint number, Placement order
225
Demultiplexer
Image data
Thumbnail creator
Thumbnail data
Thumbnail image
Decoder
Coded data
Image converter
Image information
3D image
221
204
203

FIG. 27

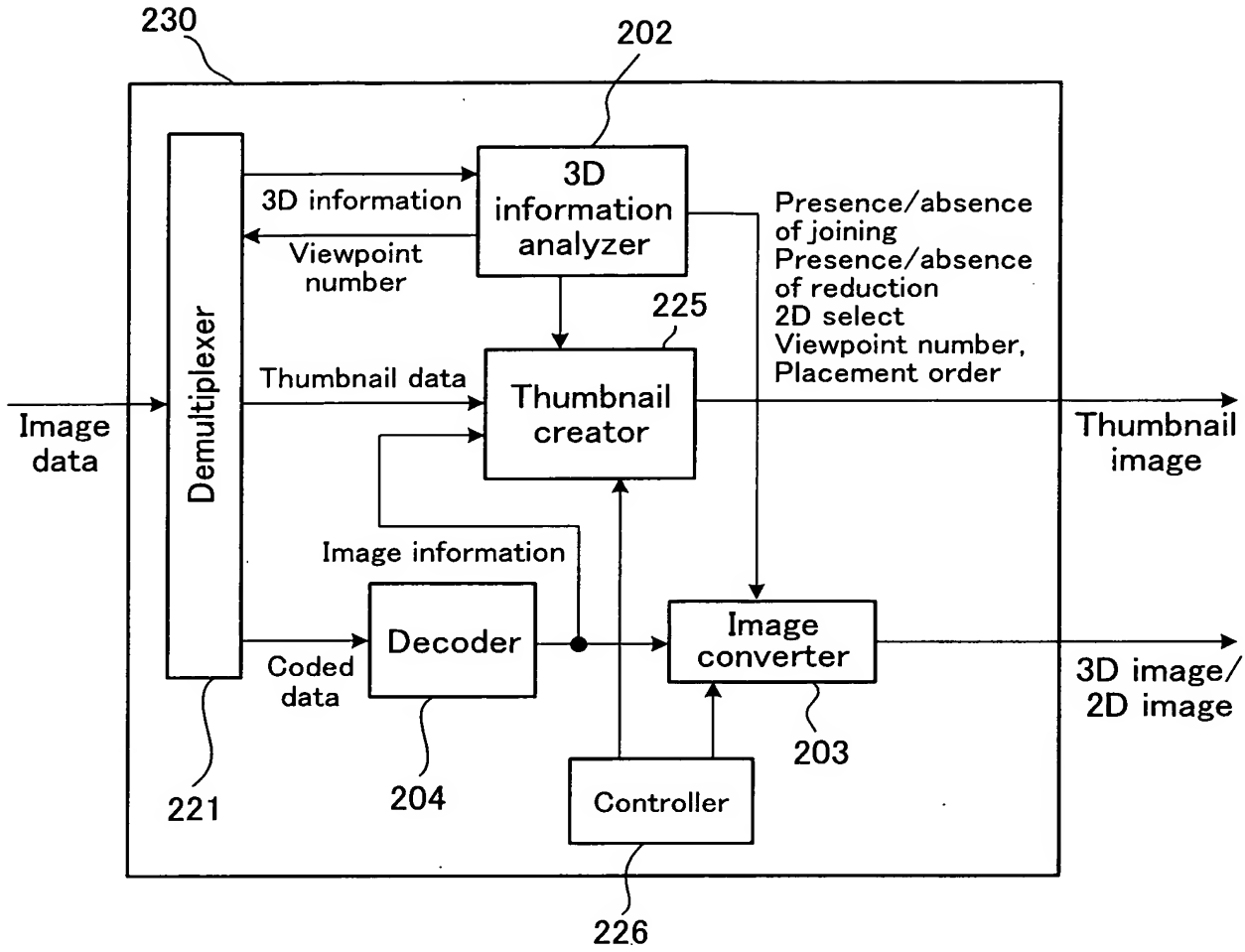

230
202
3D information analyzer
3D information
Viewpoint number
Presence/absence of joining
Presence/absence of reduction
2D select
Viewpoint number,
Placement order
225
Thumbnail data
Thumbnail creator
Image data
Demultiplexer
Thumbnail image
Image information
Decoder
Image converter
Coded data
3D image/ 2D image
203
221
204
Controller
226

FIG. 28

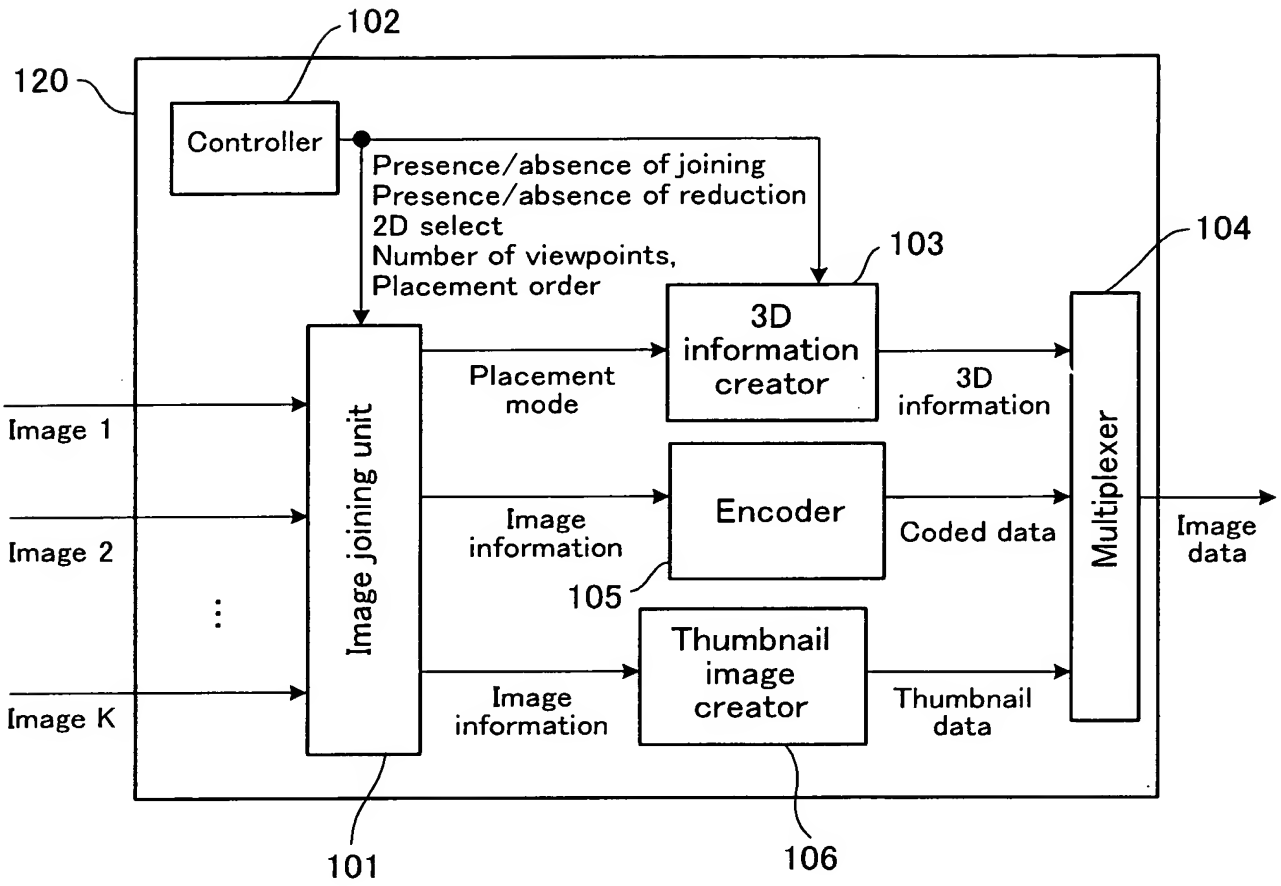

102
120
Controller
Presence/absence of joining
Presence/absence of reduction
2D select
Number of viewpoints,
Placement order
103
104
3D information creator
Placement mode
3D information
Multiplexer
Image 1
Image 2
Image K
Image joining unit
Encoder
Image information
Coded data
Image data
105
Thumbnail image creator
Image information
Thumbnail data
101
106

FIG. 29

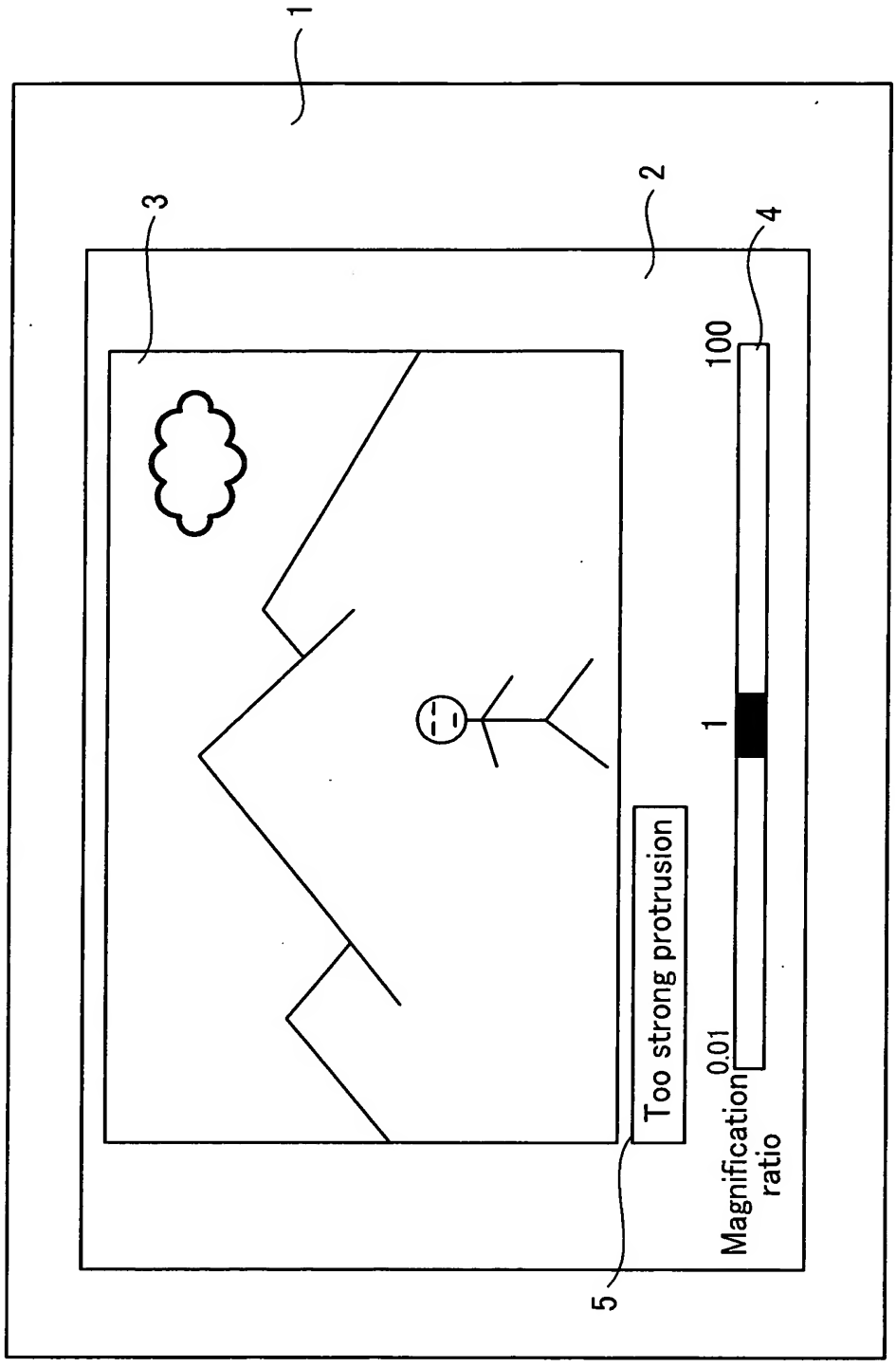


FIG. 30

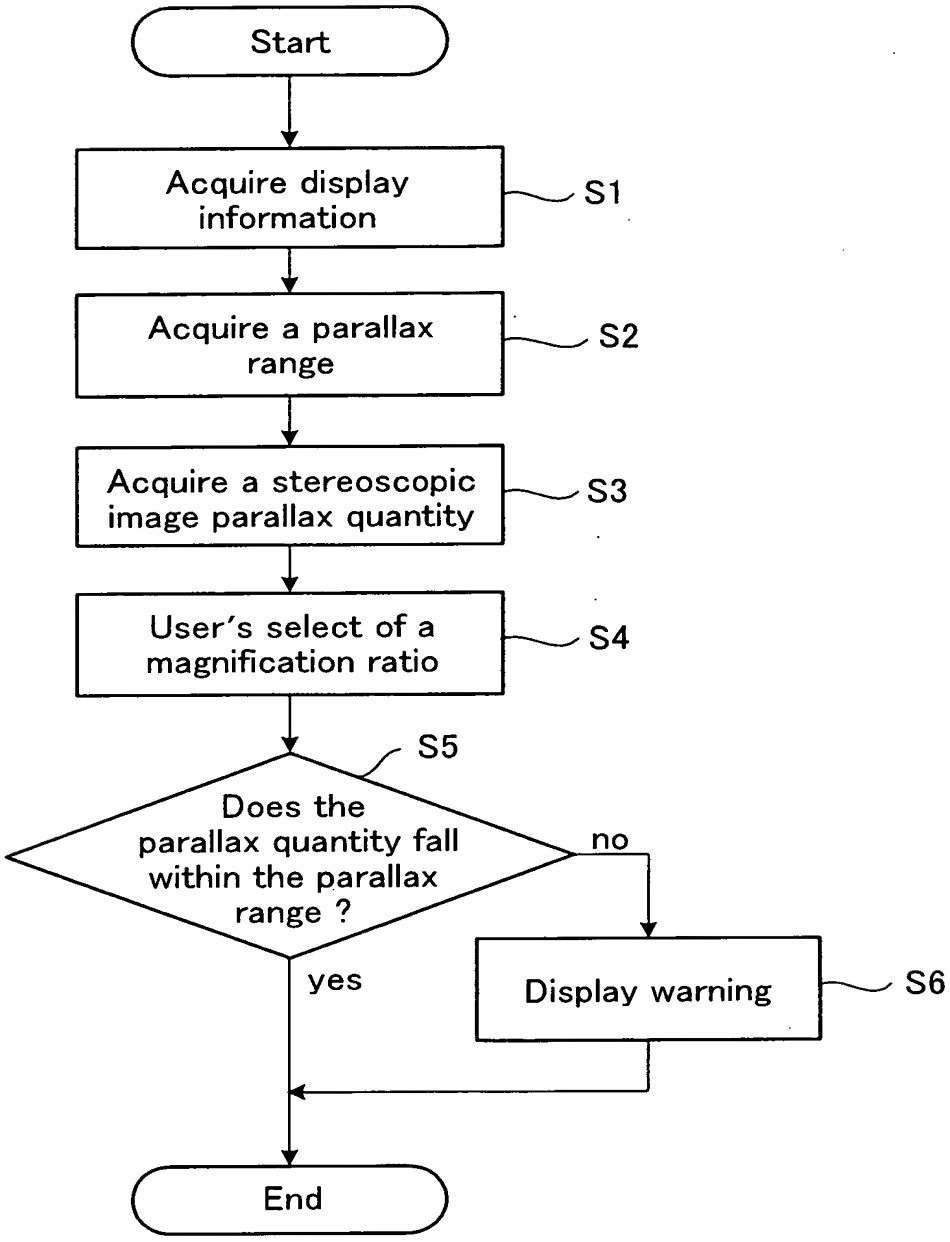

Start
Acquire display information
S1
Acquire a parallax range
S2
Acquire a stereoscopic image parallax quantity
S3
User's select of a magnification ratio
S4
S5
Does the parallax quantity fall within the parallax range ?
no
yes
Display warning
S6
End

FIG. 31

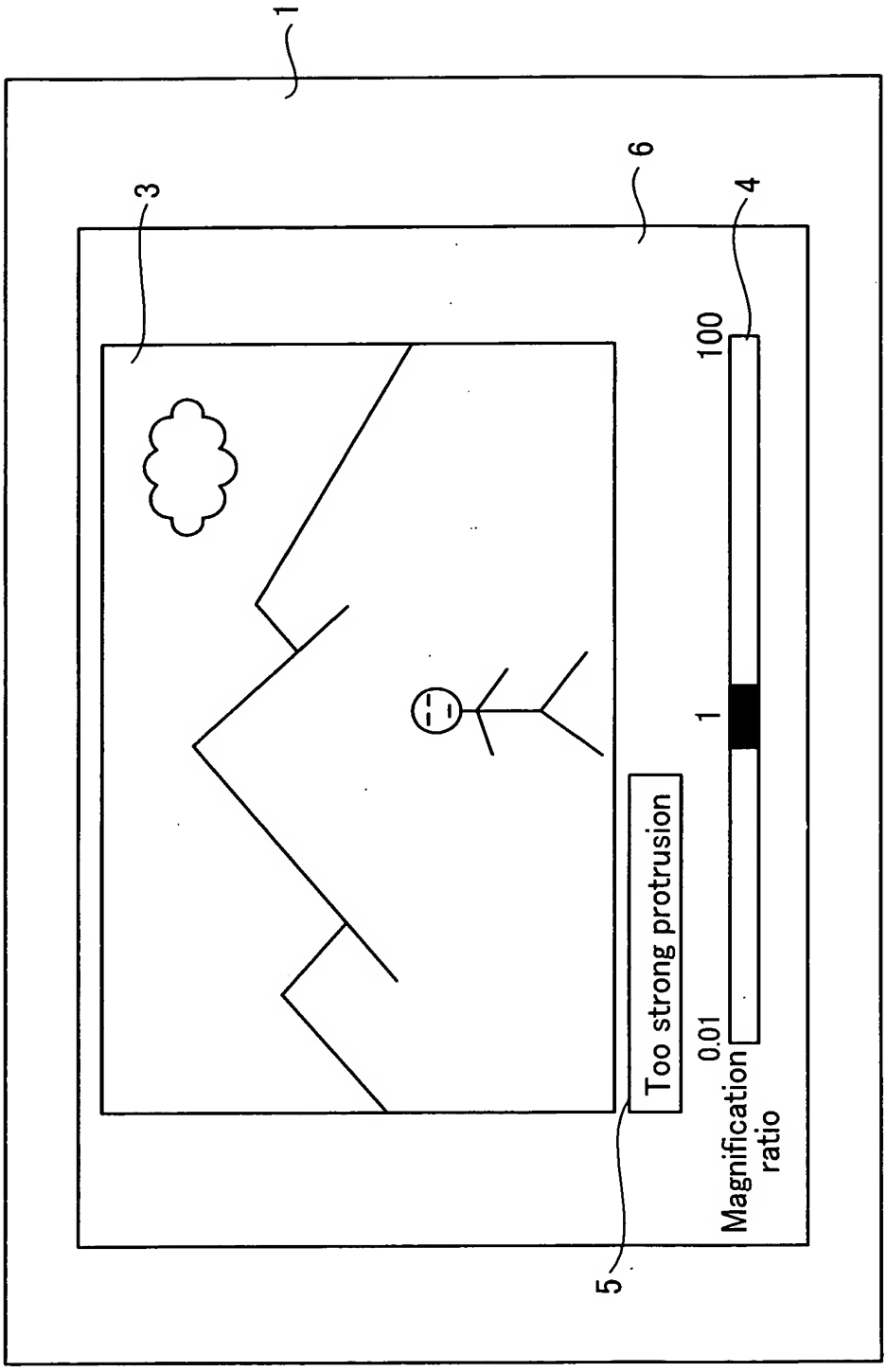


FIG. 32

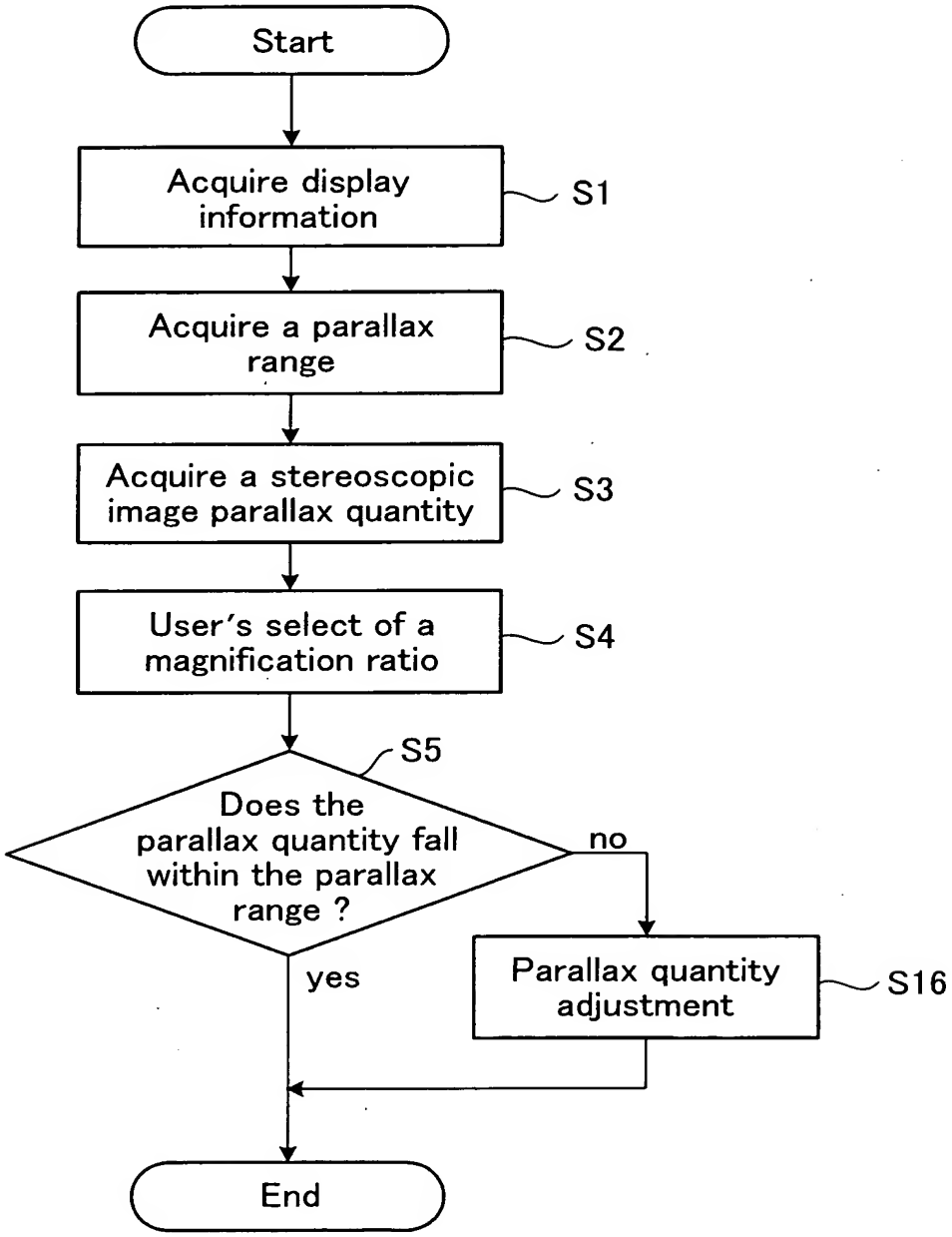

Start
Acquire display information
S1
Acquire a parallax range
S2
Acquire a stereoscopic image parallax quantity
S3
User's select of a magnification ratio
S4
S5
Does the parallax quantity fall within the parallax range ?
no
yes
Parallax quantity adjustment
S16
End

FIG. 33

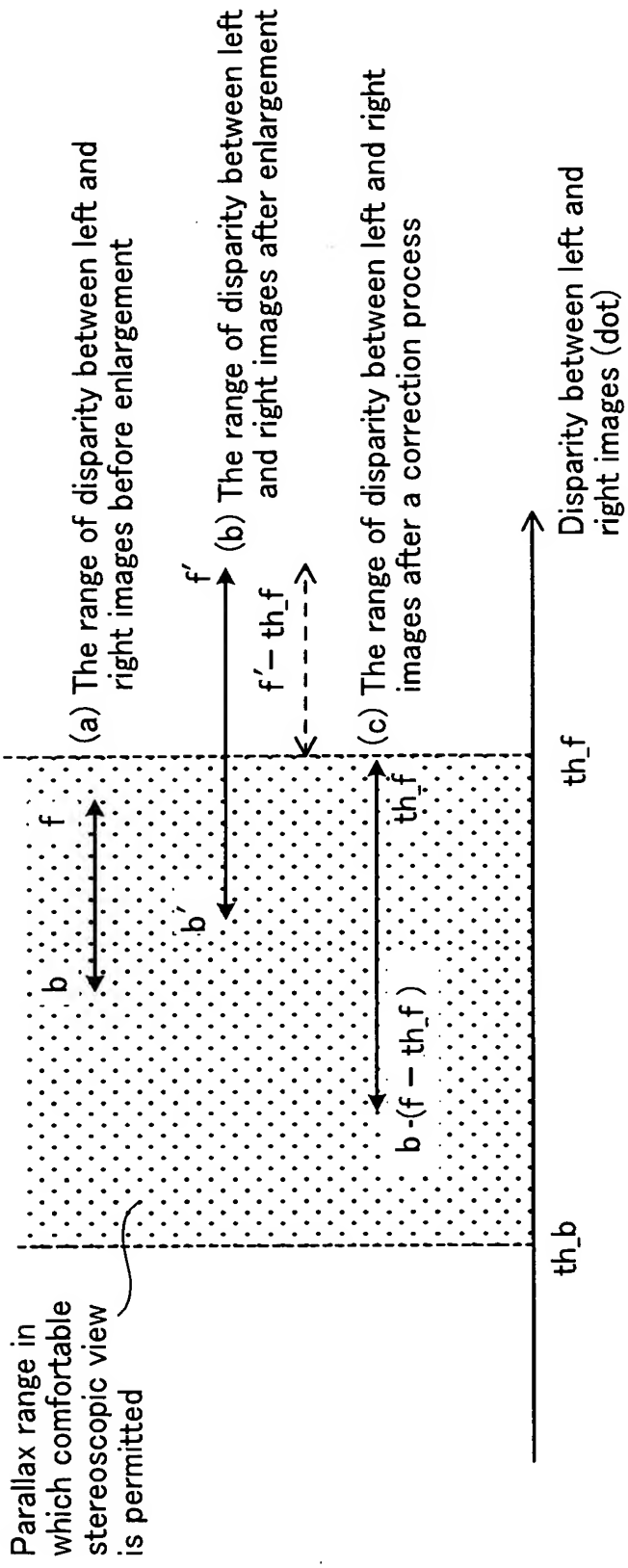

(a) The range of disparity between left and right images before enlargement
(b) The range of disparity between left and right images after enlargement
(c) The range of disparity between left and right images after a correction process
Disparity between left and right images (dot)
Parallax range in which comfortable stereoscopic view is permitted
f
b
f′
b′
f′ − th_f
b -(f − th_f)
th_f
th_f
th_b

FIG. 34

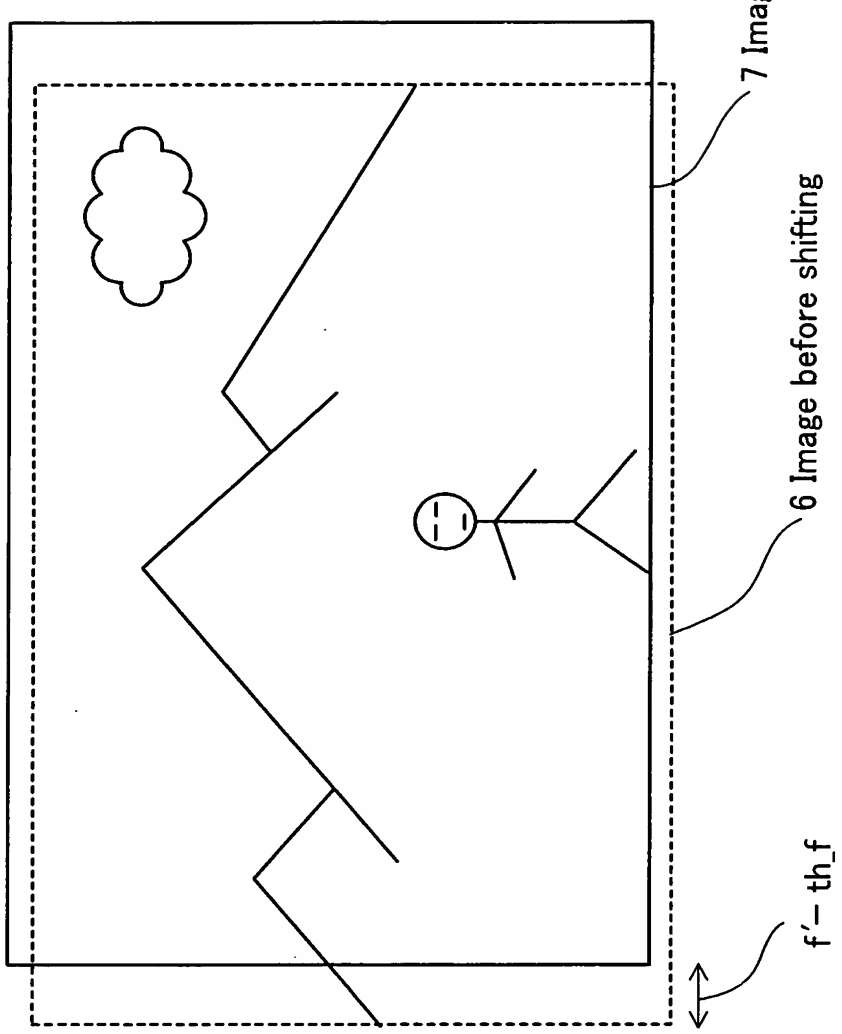


FIG. 35

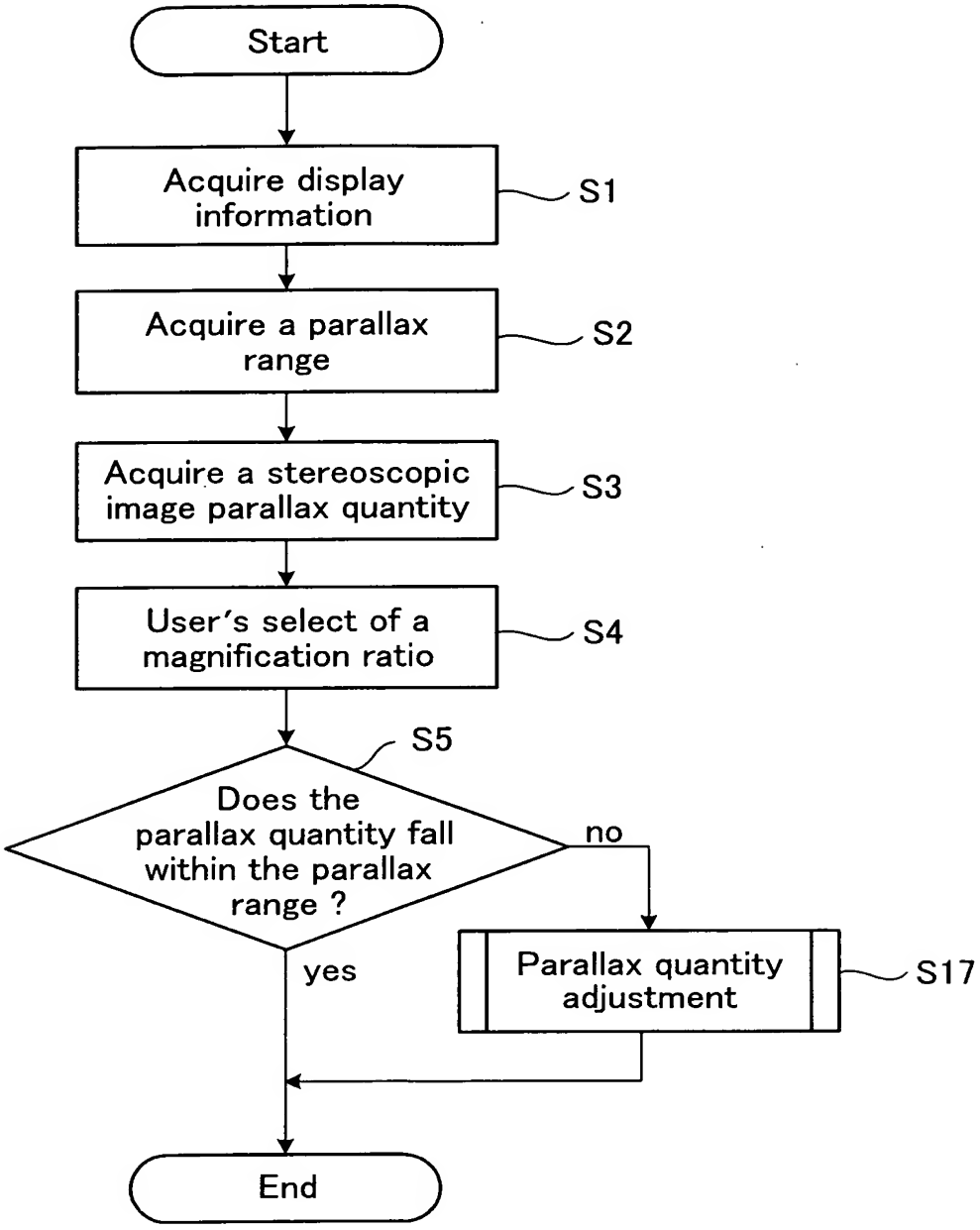

Start
Acquire display information
S1
Acquire a parallax range
S2
Acquire a stereoscopic image parallax quantity
S3
User's select of a magnification ratio
S4
S5
Does the parallax quantity fall within the parallax range ?
no
yes
Parallax quantity adjustment
S17
End

FIG. 36

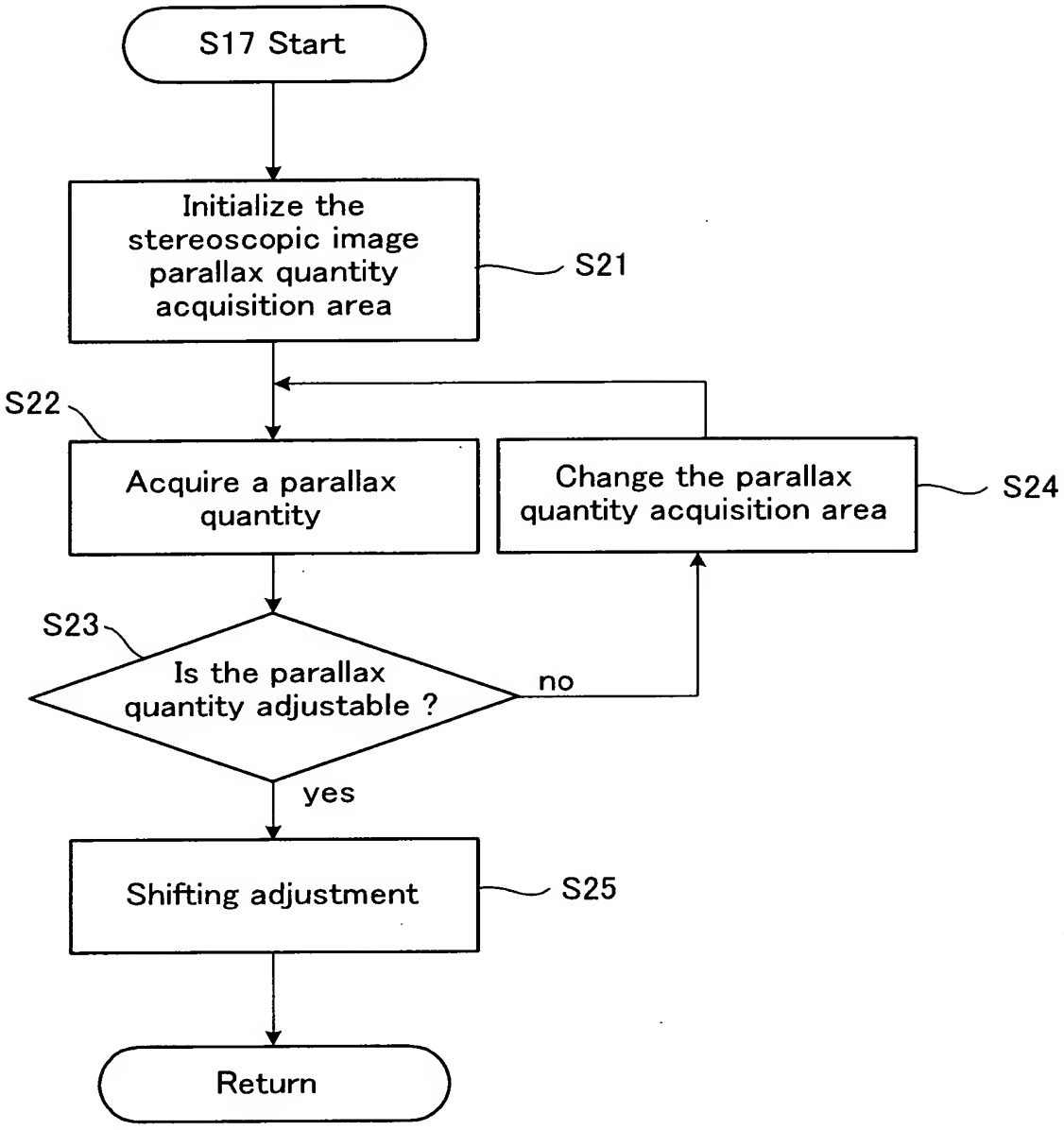

S17 Start
Initialize the stereoscopic image parallax quantity acquisition area
S21
S22
Acquire a parallax quantity
Change the parallax quantity acquisition area
S24
S23
Is the parallax quantity adjustable ?
no
yes
Shifting adjustment
S25
Return

FIG. 37

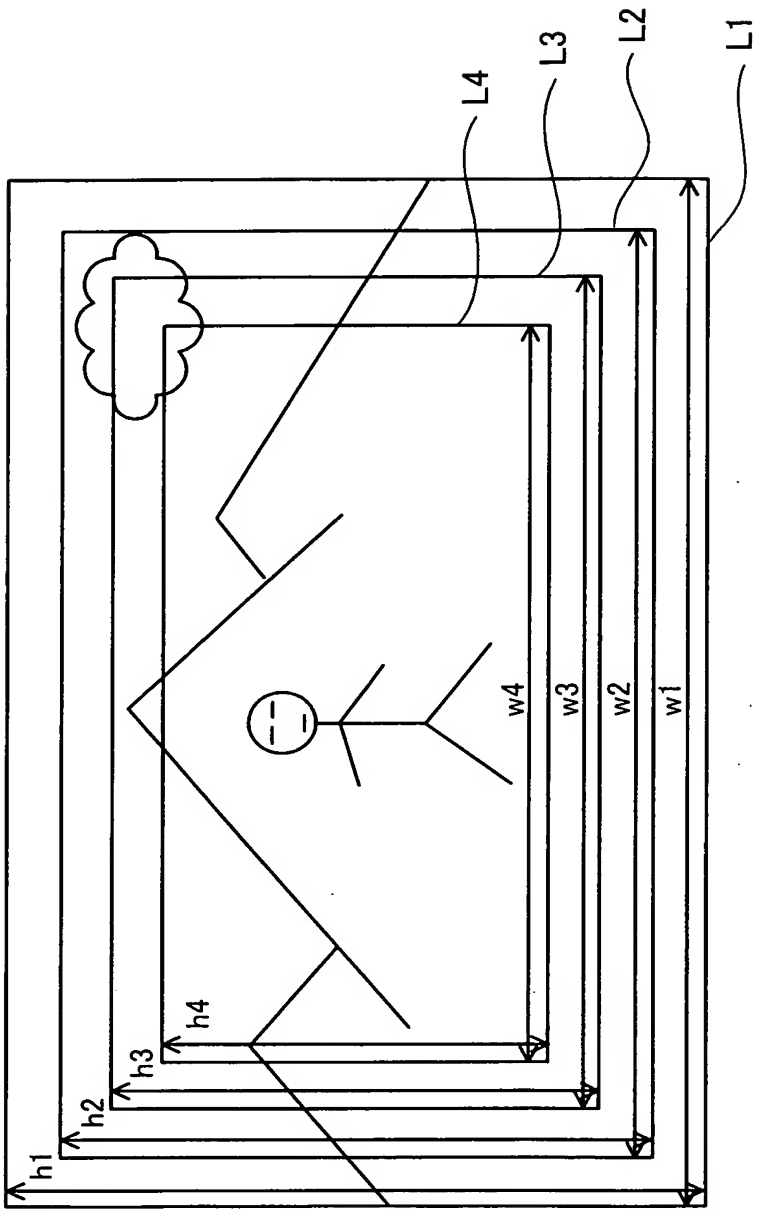


FIG. 38

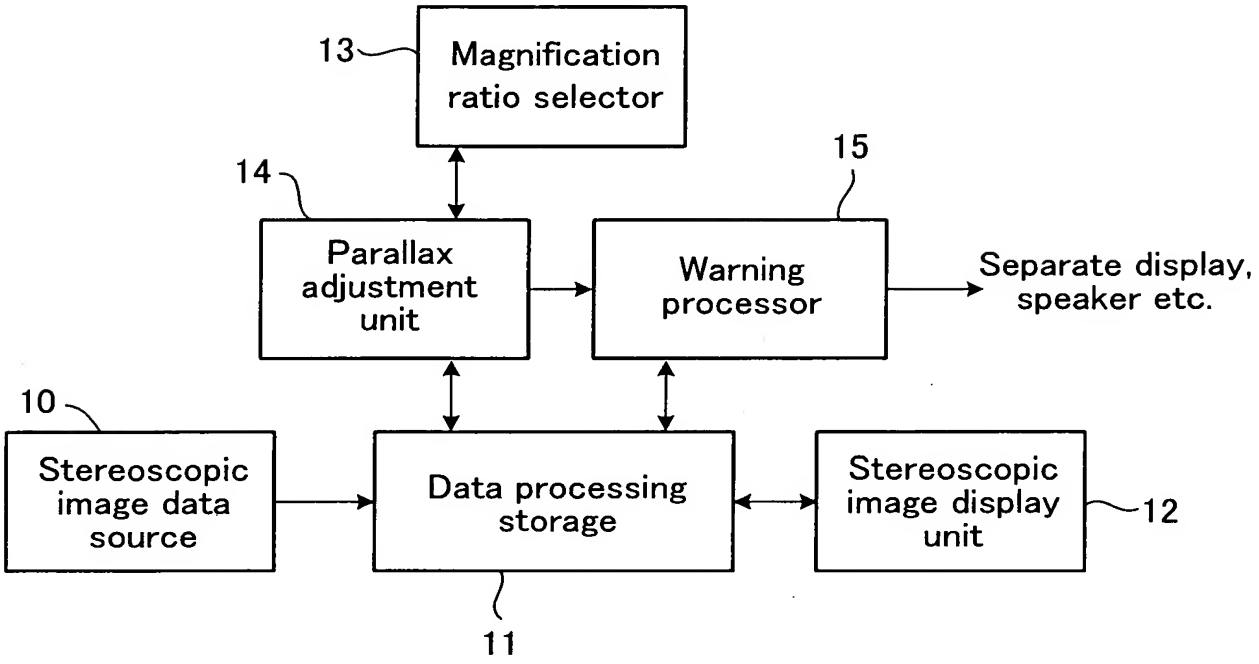
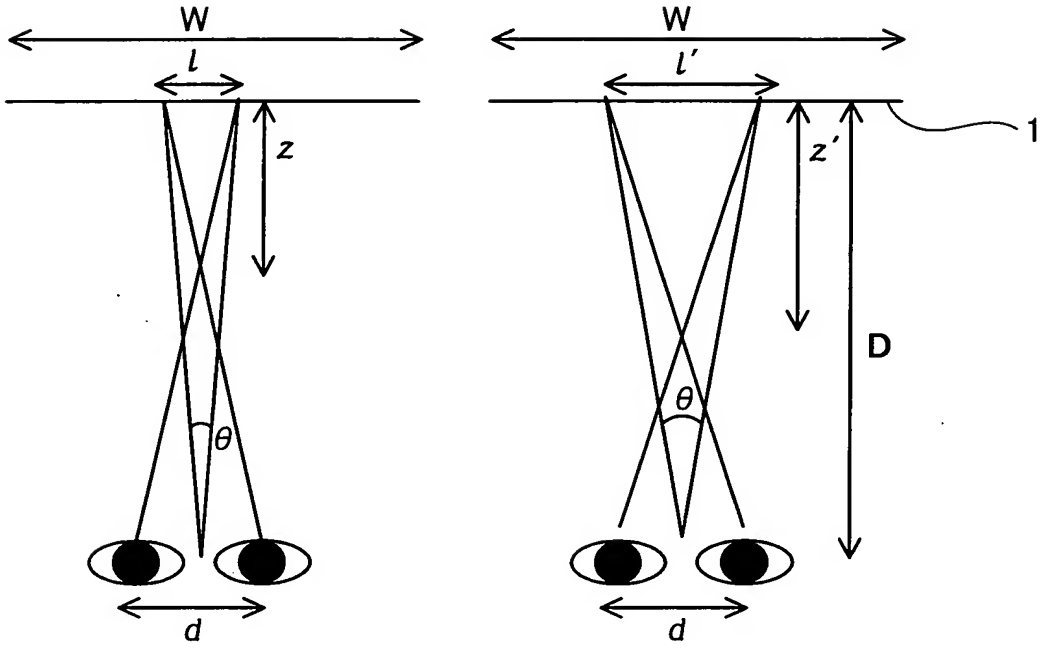

13
Magnification ratio selector
14
15
Parallax adjustment unit
Warning processor
Separate display, speaker etc.
10
Stereoscopic image data source
Data processing storage
Stereoscopic image display unit
12
11

FIG. 39



10/550710

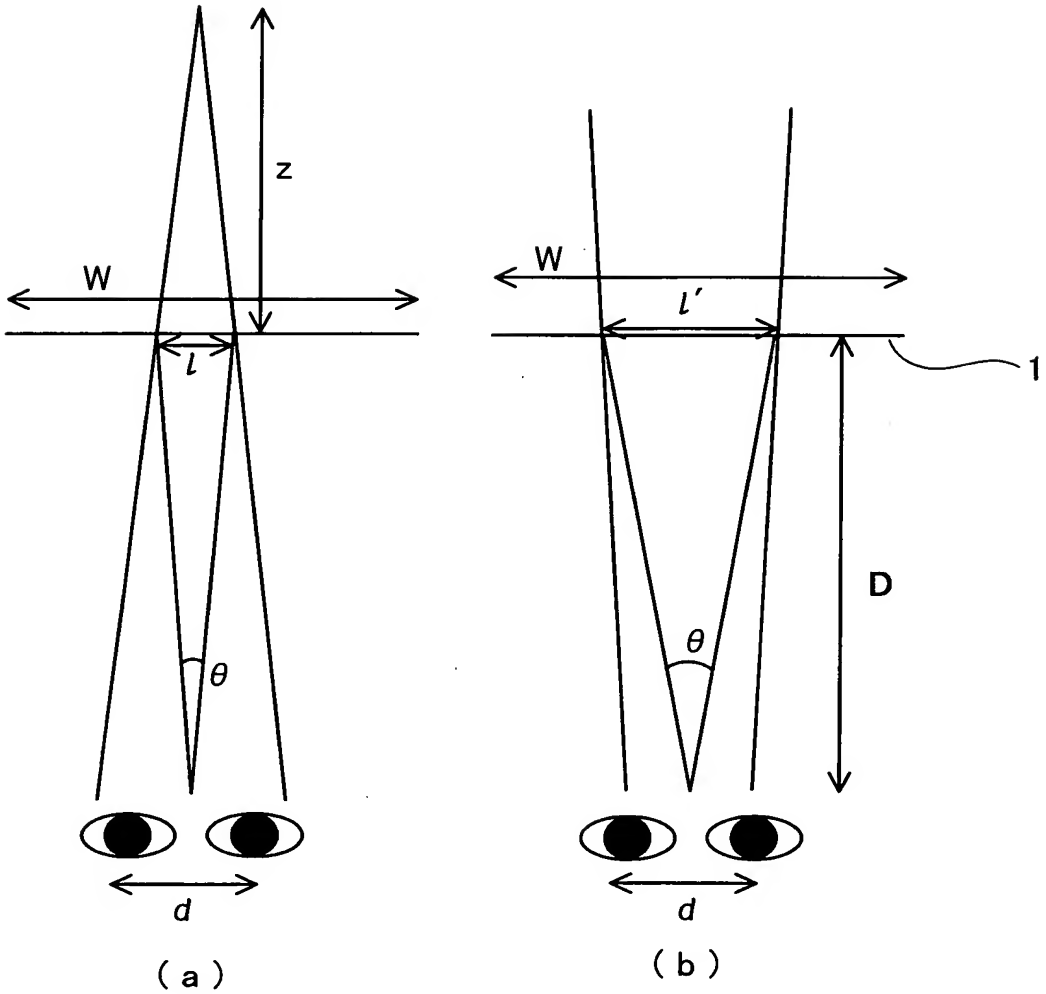



FIG. 40